

ABSTRACT

A method of making semiconductor device packages includes the steps of attaching a wafer to a dielectric layer, testing semiconductor devices in the wafer, and then dicing the layered assembly. The dielectric layer may be, for example, a flexible tape. The semiconductor devices may be chips containing integrated circuits or memory devices. The dicing operation may be performed by a circular saw or by another suitable apparatus. The chips may be connected to input/output devices, such as ball grid arrays, on the dielectric layer, before the testing and dicing steps. Full wafer testing may be conducted through the ball grid arrays. A relatively stiff metal sheet may be included in the layered assembly before the testing and dicing steps. The metal material may be used as heat spreaders and/or as electrical ground planes. The chips may be connected to the ball grid arrays by wire bonds or flip chip bumps and vias through the dielectric layer. Alignment of the wafer with respect to the dielectric tape may be accomplished by an optical device or by a magnetic system.